Research Article

JRAD Journal of Research and Advancement in Dentistry

J Res Adv Dent 2021;12:2:102-106.

A Randomised Controlled Trial for Patient Perception Regarding Dentures Made from Two Different Techniques

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ABSTRACT

Background: Patient perception is very crucial for overall success of dentures as the comfort of patients is the ultimate goal of any treatment. The two techniques evaluated in this study mainly differs in terms of number of appointment and ease of doing the treatment. Aim of this study is to evaluate the patient satisfaction with modified and conventional removable complete dentures.

Materials and Methods: A pilot randomized clinical trial with 40 edentulous patients divided in 2 groups of conventional method and the other of modified technique that eliminates the step of functional impressions. Satisfaction was evaluated at 3 and 6 months using a Numerical Rating Scale(VAS). Comparison was made using ANOVA deliberating $p<0.05$ as significant.

Result: We found no significant variations for satisfaction and the quality of the prosthesis between the two methods.

Conclusion: The alternate method of modified technique is prosthesis is a practical, more cost effective similar to conventional method.

Keywords: Denture fabrication, complete denture and modified methods.

INTRODUCTION

Edentulism has a bad impact on the elderly's overall health. There has been a decrease in edentulism among the elderly in high-income countries. The use of a removable denture to treat edentulous people is intended to considerably improve their quality of life.[1-4]

Clinical investigations have shown that it is possible to make a complete denture for edentulous patients by reducing some steps in manufacturing process and achieving a quality comparable to conventional prostheses, either on an expert's assessment or the patients' own.[5,6]

The articulator device which is deemed essential to the treatment of edentulous patients but for which there is no clear evidence of quality, is one of the reason for more time consuming as well as greatly raises the treatment cost. These prior findings strongly show that simplifying the full denture manufacturing process is economical and need fewer appointments, which would benefit poor patients especially in developing countries.[7-10] Hence we aimed to assess the patient satisfaction with modified and traditional complete dentures.

MATERIALS AND METHODS

Received: Jan. 3, 2021: **Accepted**: Mar. 12, 2021
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pISSN 2278-0076
eISSN 2321-9270

We piloted a randomized clinical trial among 40 edentulous patients who were grouped as those to receive dentures by modified technique (n=20), and control group (n=20). Exclusion criteria included pain in ridges, any bony pathology or abnormalities like tori, temporomandibular joint disorder and severly resorbed ridges whereas Patient with Type II,III,IV ridges according to Cawood and Howell Classification and who were able to understand instruction and did not have any psychological or psychiatric issues were included in the study.[9] Informed written consent were taken from all participants.

Primary impression was made with Alginate followed by preparation of preliminary model for both the groups. Control group then followed steps of custom tray fabrication, peripheral tracing secondary impression with Zinc oxide Eugenol incorporating simulated functional movements during impression making. In experimental group, the step of peripheral tracing and secondary impression was escaped and bite blocks with a lacquer base and pink wax were made on the preliminary cast obtained where as in control group bite blocks were made on the cast obtained from functional impression.

The interocclusal registrations and individualization of the blocks were made in conventional method for both groups. Obtained Face bow record, vertical dimension and centric relation were transferred in Semi Adjustible Articulator for control group whereas hinge articulator was used for transfer of sealed maxillomandibular block with zinc oxide at obtained vertical and horizontal parameters. Further lab procedures were similarly done for both the groups. The conventional and modified technique involved a total of six and five clinical appointments respectively.

After the dentures were delivered the follow-up was done at 3 and 6 months. The satisfaction survey was assessed using Numerical Rating Scale. The statistical analysis was made using the IBM SPSS ver 20. The comparisons were made using the ANOVA test deliberating $p<0.05$ as significant.

Table 1: Comparison of the demographic and clinical characteristics between the groups.

Variables	Modified	Conventional	P
	(n=20)	(n=20)	
Age in years (standard deviation)	72.5 (6.29)	70.5 (6.78)	0.61 a
Female patients (%)	12 (60)	11(55)	0.12 b
Diagnostic classification* (%)			
Maxillary			
III	14	18	
IV	6	2	0.40 c
Mandibular			
III	3	5	
IV	11	10	
V	6	5	> 0.99 c
Average overall satisfaction NRS mm [CI 95%]			
Pre	78 (68, 88)	77 (65, 89)	0.97 a
Post	80 (68,92)	86 (78,94)	0.26 a
“a: t-test; b: Pearson's Chi-square test with Yates' continuity correction; c: Fisher’s exact test”			

Table 2: Comparison using the Numerical Rating Scale for the two groups.

	Modified Group			Conventional Group		
	3 months	6months	p-value	3months	6months	p-value
General	78.6 (25.7)	79.9 (28.7)	0.758	78.9 (21.5)	86.9 (13.9)	0.464
Q1.1 what rating you give for satisfaction with dentures overall?	81 (28)	77 (33)	0.876	78 (25)	80 (25)	0.843
Q2.1 what rating you give for satisfaction with upper dentures overall?	85 (26)	76 (32)	0.758	84 (21)	89 (14)	0.575
Q2.2 what rating you give for satisfaction with lower dentures overall??	77 (34)	77 (34)	0.877	70 (36)	75 (33)	0.594
Q3.1 what rating you give for comfort with upper dentures?	86(27)	80 (32)	0.764	88 (25)	90 (12)	0.467
Q3.2 what rating you give for comfort with lower dentures?	69 (28)	81 (33)	0.501	66 (34)	84 (21)	0.441
Q4.1 what rating you give for upper dentures retention?	88 (28)	84 (33)	0.682	92 (24)	94 (15)	0.739
Q4.2 what rating you give for lower dentures retention?	76(33)	75 (35)	0.959	65 (36)	75 (35)	0.355
Q5.1 what rating you give for speech with upper dentures?	84 (36)	76 (37)	0.624	91 (24)	96 (18)	0.718
Q5.2 what rating you give for speech with lower dentures?	79 (38)	75 (37)	0.725	79 (38)	77 (35)	0.975
Q6.1 what rating you give for chewing with upper dentures?	82 (36)	82 (34)	0.649	89 (25)	97 (14)	0.469
Q6.2 what rating you give for chewing with lower dentures?	77 (36)	72 (34)	0.978	70 (37)	75 (35)	0.453
Q7.1 Are you able to clean upper denture easily?	93 (21)	87 (23)	0.725	89 (24)	68(24)	0.464
Q7.2 Are you able to clean lower denture easily?	89 (5)	90 (25)	0.382	91 (23)	86 (14.	0.464
Q8.1 How much are you satisfied with appearance of upper denture ?	86 (33)	86 (34)	0.754	92 (24)	92 (26)	0.856
Q8.2 How much are you satisfied with appearance of lower denture ?	90 (33)	70(33)	0.544	85 (26)	89 (19)	0.563

RESULTS

There was no significant variation present in age, gender and diagnostic classification of patients involved in the study. Also, no significant variations

between the groups for the demographics and the satisfaction average between the prostheses made using the modified or conventional procedure. Clinicians found no differences or troubles for adjusting the dentures between the groups after the insertion and delivery as shown in **Table 1.**

The pre-post analysis of the items on the satisfaction questionnaire is in Table 2. No significant differences were found in the ratings between groups for the pre or post comparisons for the items. No adverse effects were reported in any of the groups.

DISCUSSION

In the present study, similar satisfaction level was found for dentures made from conventional as well as modified approach at 3 and 6 months after denture insertion. When satisfaction, comfort, stability, phonetics, chewing, cleanliness, convenience, and aesthetic appearance were examined individually for upper and lower dentures, the results showed that they were all similar, with no statistically significant differences. These findings are consistent with those found in the literature, in a clinical research with follow-up at 3 and 6 months, Kawai et al.,[11] found that patients who received modified and traditional prostheses had similar levels of satisfaction. Kawai et al.,[11] also used irreversible hydrocolloid alginate impression to obtain the working model and eliminated the use of articulator and facebow assembly. Also Heydecke et al.,[7] used two techniques, one was face-bow assembly (Gerber) in an articulator with fabrication of denture in centric relation, and another modified technique of Gysi denture, in a clinical study with a three-month follow-up in 20 patients, and found no differences in overall patient satisfaction.[7] Overall, these findings imply that the standard procedure can be streamlined by removing some processes while maintaining patient satisfaction.[11] The use of articulator-face bow assembly as well as the peripheral tracing with functional impression both were removed in this example. The current study has limitations of smaller sample size and relatively short follow-up period of 6 months and further studies are required to assess the patient satisfaction level in longer years of duration.

The choice was made to examine patient satisfaction rather than prosthesis quality as most of patients who wore complete removable dentures were satisfied with the prosthesis, regardless of its quality.[12]

This prospective clinical trial shows that the modified technique for making a denture produces the similar results in terms of patient satisfaction and quality as the conventional technique, implying that the time spent on the latter in taking a complex impression with modelling compound combined with another secondary material (silicone or zinc oxyde eugenol paste), registration with a face-bow, and reocclusion has little or no substantial impact on the final result. It is recommended that, in addition to the conventional technique for complex cases with highly resorbed ridge , the modified technique be used by the clinicians as an alternative to more time consuming and sophisticated conventional technique.

CONCLUSIONS

This randomized clinical trial found no significant differences between the standard and modified techniques in terms of patient satisfaction or overall quality of dentures produced. These findings justify the usage of the modified technique, owing to its ease of implementation and significant cost savings. This alternate method of producing a complete dental prosthesis should be taught in dental schools as well as be used in clinics to give economical and less time consuming treatment for patients.

CONFLICTS OF INTEREST

The authors declare they have no potential conflict of interest regarding this article

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